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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,210	07/11/2003	Christian Georg Gerlach	Q76413	3108
23373 7590 10/30/2007 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			EXAMINER WOZNIAK, JAMES S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/617,210	Applicant(s) GERLACH, CHRISTIAN GEORG	
	Examiner James S. Wozniak	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the office action from 4/20/2007, the applicant has submitted an amendment, filed 8/20/2007, amending independent claims 1 and 7, while adding new claims 12-18 and arguing to traverse the art rejection based on the limitation regarding dividing a codebook into a plurality of codebook groups (*Amendment, Page 14*). Applicant's arguments have been fully considered, however the previous rejection is maintained due to the reasons listed below in the response to arguments.

2. In response to added Figs. 3-4 and the corresponding amended portions of the specification, the examiner has withdrawn the previous drawing objection. It is noted, however, that the amended specification and drawings raise an issue of new matter because use of a single calculation unit was not disclosed in the original specification (see below rejection).

3. In response to amended claims 1, 3, and 5, the examiner has withdrawn the previous objections directed to minor informalities.

4. Due to the cancellation of claim 10, the examiner has withdrawn the previous objection directed towards an improper dependent claim.

5. In response to the amended claims, the examiner has withdrawn the previous 35 U.S.C. 112, second paragraph rejections.

Response to Arguments

6. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

With respect to the previous 35 U.S.C. 101 rejection directed to non-statutory subject matter, the applicant argues that the amended claims overcome said rejection (*Amendment, Page 12*). In response, the examiner notes that although some aspects of the previous 35 U.S.C. 101 rejection have been overcome, namely the lack of active processing steps (*see prior OA, Page 7*), the previous rejection is maintained because the final result does not accomplish a practical application and does not generate a “useful, concrete, and tangible result” (*see prior OA, Page 7*). In order for a claimed invention to be considered statutory under 35 U.S.C. 101, it must be useful and accomplish a practical application. That is, it must produce a “useful, concrete and tangible result” (*State Street, 149 F.3d at *1373-74*, *47 USPQ2d at 1601-02*). In claim 1, the final result is directed to a determined abstract optimal codevector within a processor. This vector is not output to a user in any form or encoded and transmitted, and thus, claim 1 does not produce a “useful, concrete and tangible result”. Also since no real-world signal (speech or audio) is processed in the claim (only codebook processing is claimed), claim 1 does not accomplish a practical application. Thus, claim 1 remains rejected under 35 U.S.C. 101.

Amended claim 7 contains similar subject matter and is rejected under 35 U.S.C. 101 under similar rationale.

With respect to **Claim 1**, the applicant argues that Kwan et al ("*Implementation of DSP-RAM: An Architecture for Parallel Digital Signal Processing in Memory*," 2001) fails to teach "dividing said codebook into a plurality of codebook groups" because Kwan instead teaches "dividing a codebook into codeword vectors" (*Amendment, Page 14*).

In response, the examiner notes that the passage cited by the applicant, stating that the codeword vector is distributed over the processing elements, refers not to the codebooks, but the incoming data vectors. The codebook taught by Kwan, however, is divided. Kwan notes that a "codebook [is] distributed over the available set of PEs" (*Section 3.3, Page 345*). The input speech data is then distributed to each of the subsets of the divided codebook to select a local optimal vector, and subsequently, an overall optimal vector (*Section 3.3, Page 345*). Kwan's teaching of the divided codebook groups is further evidenced in Figure 6. Fig. 6 shows that a codebook is divided into *sets* and placed into parallel processing elements. Thus, for at least these reasons, Kwan anticipates the aforementioned claim limitations.

The applicant further provides a summary of Davidson et al (U.S. Patent: 4,868,867) and argues that Davidson fails to teach the limitations of claim 1. In response the examiner notes that Kwan is relied upon as teaching such limitations, as is pointed out above.

The art rejection of the dependent claims is traversed for reasons similar to claim 1 (*Amendment, Page 16*). In regards to such arguments, see the response directed towards claim 1.

Drawings

7. The drawings are objected to because figure 3 contains a single calculation unit, which is drawn to new matter. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

8. **Claims 1-6, 11-12, and 16-18** are objected to because of the following informalities:

In claim 1, line 10, “determining plurality of” should be changed to –determining a plurality of--.

Claims 2-6, 11-12, and 16-18 are further objected to by virtue of their dependency.

Appropriate correction is required.

Specification

9. The amendment filed 8/20/2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: a single calculation unit (*added to page 9*). The specification originally only mentioned that a plurality of calculation units is utilized.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 101

10. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

11. **Claims 1-9 and 11-18** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 is drawn to a processing method for determining an optimal abstract vector using a parallel codebook searching algorithm. In order for a claimed invention to be considered statutory under 35 U.S.C. 101, it must be useful and accomplish a practical application. That is, it must produce a “useful, concrete and tangible result” (*State Street, 149 F.3d at *1373-74*),

47 USPQ2d at 1601-02). Since the final result of the claimed invention is an abstract optimal vector and not a tangible real-world output (for example, transmitted speech vectors or a synthesized speech output), claim 1 is directed to non-statutory subject matter.

The remainder of the dependent claims further limit rejected independent claim 1, and thus, are also directed to non-statutory subject matter.

Claim 7 is drawn to a processor for determining an optimal abstract vector using a parallel codebook searching algorithm. In order for a claimed invention to be considered statutory under 35 U.S.C. 101, it must be useful and accomplish a practical application. That is, it must produce a “useful, concrete and tangible result” (*State Street*, 149 F.3d at *1373-74, 47 USPQ2d at 1601-02). Since the final result of the claimed invention is an abstract optimal vector and not a tangible real-world output (for example, transmitted speech vectors or a synthesized speech output), claim 7 is directed to non-statutory subject matter.

The remainder of the dependent claims further limit rejected independent claim 7, and thus, are also directed to non-statutory subject matter.

Claim Rejections - 35 USC § 112

12. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

13. **Claims 7-9, 13, and 15** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter that was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 7 recites “configurable hardware...” but lack means for performing the operations that the processor performs.

A single means claim, i.e., where *a means recitation does not appear in combination with another recited element of means*, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor.

Dependent claims 9, 13, and 15 do not remedy the lack of enablement issue noted above with respect to claim 1, and therefore, are also rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. It is noted, however, that the memory of claim 8, would overcome this rejection if incorporated into claim 7, but this claim is rejected by virtue of its dependency.

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15. **Claims 7-9, 11, and 13-15** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the means for configuring the hardware. From the present claim language, it is not clear how the hardware is being configurable to carry out the recited processing steps.

It is also unclear from the claim language, whether the applicant is attempting to claim a processor and related structures or a method that is performed when a computer program executed in a processor. The claim should be amended to clearly reflect what the applicant regards as the invention.

Claims 8-9, 13, and 15 are further rejected by virtue of their dependency.

Claim 11 recites that a decoder can perform the method of claim 1, which is a method for “coding a signal”. It is unclear how a decoder can perform an opposite coding operation. This claim previously included that claim 1 is carried out using a codec or combination coder/decoder. In this case, which is supported in the specification, coding would be able to be performed by the coder element of the codec. Thus, it is recommended that the applicant incorporate this subject matter into claim 11 (currently included in claim 14) in order to overcome this aspect of the 35 U.S.C. 112, second paragraph rejection. Claim 14 is further rejected by virtue of its dependency.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. **Claims 1-2, 6-9, and 11-18** are rejected under 35 U.S.C. 102(b) as being anticipated by Kwan et al ("*Implementation of DSP-RAM: An Architecture for Parallel Digital Signal Processing in Memory*," 2001).

With respect to **Claim 1**, Kwan recites:

K code vectors is provided for vector quantization of a signal vector representing a set of signal values of said signal (*codeword vectors corresponding to a speech signal, Section 3.3, Page 344*),

Performing a codebook search for determining an optimal code vector of said codebook, wherein said codebook search is performed in parallel by (*codebook search performed in parallel, Section 3.3, Pages 344-345*):

Dividing the codebook into a plurality of codebook groups (*distributing a voice codebook over multiple processing elements, Section 3.3, Pages 344-345; and Fig. 6*);

Simultaneously determining a plurality of optimal group code vector each of which corresponds to one of said plurality of codebook groups (*simultaneously determining a lowest error vector match with each divided codevector set, Section 3.3, Pages 344-345*); and

Determining an optimal code vector of said codebook from the plurality of optimal group code vectors (*finding the closest matching codevector over all of the processing elements, Section 3.3, Pages 344-345*).

With respect to **Claim 2**, Kwan further discloses:

The step of determining said optimal code vector among said p optimal group code vectors comprises evaluating an index of each optimal group code vector uniquely identifying each optimal group code vector within said codebook (*evaluating the closest codevectors over all processing elements, wherein codevectors are identified by a codebook index, Section 3.3, Pages 344-345*).

With respect to **Claim 6**, Kwan further discloses:

The codebook comprises pulse code vectors (*CELP codevectors, which comprise excitation pulse vectors, Section 3.3, Page 345*).

With respect to **Claim 7**, Kwan teaches the method of claim 1 and further discloses:

A processor with configurable hardware and/or with acceleration means specifically designed for said method is used for parallel execution of steps of said method (*digital signal processor (configurable hardware) with parallel processing elements (i.e., acceleration means) for faster codebook searching (acceleration means), Fig. 6*).

With respect to **Claim 8**, Kwan further discloses:

The processor provides means for simultaneously accessing a plurality of said signal values located in a memory (*simultaneously accessing many stored code vectors in parallel processing elements, Section 3.3, Pages 344-345*).

With respect to **Claim 9**, Kwan further discloses:

A standard processor further comprising a calculation module, is used for parallel execution of steps of said method, and wherein said steps of said method are optimized regarding calculation means of said standard processor and/or execution time (*DSP programmed calculation means used to enable parallel speech coding with increased speed and efficiency, Section 3.3 and 4, Pages 344-345*).

With respect to **Claim 11**, Kwan further discloses:

Coder and decoder, in particular speech and/or audio signal CODEC, capable of performing a method according to claim 1 (*voice coding and decoding, Section 3.3 and 4, Pages 344-345*).

With respect to **Claim 12**, Kwan further discloses:

The signal is an audio or speech signal (*voice coding, Section 3.3, Page 344-345*).

With respect to **Claim 13**, Kwan further discloses:

The processor is a digital signal processor (*DSP, Sections 3.3 and 4, Pages 344-345*).

With respect to **Claim 14**, Kwan further discloses:

The coder and decoder are at least one of speech and audio signal Codecs (*G.728 voice coder/decoder, Section 4, Page 345*).

With respect to **Claim 15**, Kwan further discloses:

A plurality of calculation units, each of which determines optimal code group vectors of a respective one of the plurality of codebook groups, wherein the plurality of calculation unit execute said determining simultaneously (*plurality of parallel processing elements that each determine a best match within each codevector set, Section 3.3, Page 345 and Fig. 6*).

With respect to **Claim 16**, Kwan further discloses:

Each codebook group comprises a number of code vectors wherein the number of code vectors is a fraction of the plurality of code vectors (codebook is divided into smaller codevector sets, Fig. 6).

With respect to **Claim 17**, Kwan further discloses:

Each code vector is uniquely identifiable by a unique index (*code vectors are each assigned an index, Section 3.3, Page 344*).

With respect to **Claim 18**, Kwan further discloses:

The code vectors contained in a first codebook group are mutually exclusive from the code vectors contained in a second codebook group (*different codebook sets are assigned to each processing element to increase searching speech, Fig. 6; and Section 3.3, Page 345*).

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. **Claims 3-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwan et al in view of Davidson et al (*U.S. Patent: 4,868,867*).

With respect to **Claim 3**, Kwan recites the parallel process for encoding a voice signal as applied to Claim 1. Although Kwan does not explicitly describe the entire encoding process in

detail, including a shape-gain step, such a step is well known in the speech coding art as is evidenced by Davidson (*Col. 16, Lines 32-56*).

Kwan and Davidson are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Kwan with the well known gain factor taught by Davidson in order to provide information required for speech synthesis at a decoder that also minimizes distortion in a reproduced speech signal (*Kwan, Col. 3, Lines 7-18*).

With respect to **Claim 4**, Kwan discloses the comparison of the best codevectors of each processing element to determine the overall best codevector, as applied to Claim 1 and also shown in Fig. 7. Kwan does not explicitly disclose the well-known comparison expression for comparing codevectors recited in Claim 4, however Davidson recites this well-known expression for the benefit of providing a comparison scheme suitable for a DSP that has low memory requirements (*Kwan, Col. 12, Lines 15-59*).

With respect to **Claim 5**, Davidson further discloses well-known CELP processing means including a synthesizing section and stored auto-correlation/impulse response matrices (*Col. 12, Line 60- Col. 13, Line 19; Col. 14, Lines 15-56; and Fig. 5*).

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2626


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
10/22/2007


PATRICK N. EDOUARD
SUPERVISORY PATENT EXAMINER